

## International Student Carbon Footprint Challenge – Social Media as a Content and Language Integrated Learning Environment

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**Abstract.** Environmental education (EE) is now clearly specified in educational standards in many parts of the world, and at the same time the view of language learning is moving towards a content and language integrated learning (CLIL) strategy, to make English lessons more relevant and attractive for students (Eurydice, 2006). In this respect, environmental and English instruction can be merged to benefit both purposes and to offer learning experiences that go beyond the school walls. Einztein, the social learning network for the education community, collaborates with the environmental project Inquiry-to-Insight (<http://i2i.stanford.edu/>) inviting high school students around the world to participate in the International Student Carbon Footprint Challenge (ISCFC), challenging students to learn about the environmental impact of their lifestyle choices on their carbon footprints. In the ISCFC, students use an online carbon footprint calculator to measure the amount of CO<sub>2</sub> (carbon dioxide) released by their everyday choices (food, transportation, etc). Teachers then share student data with other classrooms around the globe and use Einztein to engage students in several environmental discussions online using English as the lingua franca. Students use Einztein to reflect upon their own carbon footprint, envision global and local solutions and share knowledge about environmental issues. For this study we focused on a specific discussion and investigated the discourse structure of students from six different countries (USA, Croatia, Switzerland, Iceland, Greece and Bulgaria) reflecting upon their very own CO<sub>2</sub> emissions. Preliminary results indicate that the students' presumptions about their own impact are crucial and whether they are English natives or not is not as important when it comes to developing an understanding of their own responsibilities regarding carbon footprint. Thus, in relation to a motivating content, the students' English is productive and sufficient enough for communication and collaboration.

**Keywords:** CLIL, environmental education, international collaboration, English language learning, social media.

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## 1. Introduction

Environmental education (EE) is highly important in contemporary schooling and has for quite some years been clearly specified in educational standards in most European countries (UNESCO, 1975). For example, issues concerning the carbon dioxide in the atmosphere that now requires immediate reduction, have to be managed both locally and globally. Questions about environmental awareness, for example the impact of an individual's everyday choices regarding travel, food, and lifestyle, is however not everyday knowledge for young people, but rather complex from a knowledge point of view, and require insights into many fields. EE requires critical and action-oriented practices focusing on relevant and practical problems, and such questions are not only interdisciplinary in their nature but also cause undeniable concern for people worldwide. The global aspect of EE thus makes it outermost suitable to deal with in school settings by integrating the content with language learning. The view of language learning in content and language integrated learning with a focus on the subject that is taught through the medium of a second language has also attracted much attention in Europe and other parts of the world in the last decade (Eurydice, 2006). As argued by David Marsh (2008), who coined the acronym of CLIL in 1996, “[t]his approach can be viewed as being neither language learning, nor subject learning, but rather an amalgam of both” (p. 233). This perspective together with the massive development within digital media has resulted in a situation where communication is managed in a variety of new manners that has impact on students' language learning. Already in 2002, Marsh stated that “the recent availability and use of new technologies, in particular, has had a considerable impact on learner attitudes” (Marsh, 2002, p. 10). Today this is truer than ever with ubiquitous possibilities for people to interact in a variety of social media through smartphones, computers, iPads, etc. Social media also imply challenges for educational practices where communication and the easy access to vast sources of information complement, but also sometimes challenge, traditional media, such as, for example, textbooks. Interacting in different social media contexts can be seen as new arenas in which young people use and develop other language skills and competencies relevant to language learning (see e.g., Blattner & Lomica, 2012; Bonderup-Dohn, 2009). From a more traditional perspective, these competencies are not easily defined within the frames of what is usually acknowledged and assessed in school (Thorne, 2009). Thus, we have the multidisciplinary subject environmental education with a goal to globally educate young people in sustainability. We have goals of language learning to involve students in developing communicative skills by using the language for meaningful purposes and we have communicative conditions that are dramatically changing due to the enormous expansion of various kinds of social media. In line with the arguments above, the basis of this research is tripartite; environmental education, English language learning, and social learning network context.

In this study, we explore how high school students from 6 countries learn about EE in a social learning network called Einztein using English as a lingua franca. The study is part of the environmental project Inquiry-to-Insight inviting high school students around the world to participate in the International Student Carbon Footprint Challenge, challenging students to learn about the environmental impact of their own lifestyle choices on their carbon footprints. For this study, we focused on a specific discussion and investigated the discourse structure of students from the countries USA, Croatia, Switzerland, Iceland, Greece and Bulgaria reflecting on their own CO<sub>2</sub> emissions using English to discuss and communicate online.

## **2. Method**

The analysis, as described above, is based on students' asynchronous postings using English in the social learning network Einztein.com. In this study, the high school students discuss their results from the I2I Carbon Footprint Challenge Calculator, which is a calculator for measuring personal carbon dioxide emissions. This calculator is very particular since it takes into account the location of the students and provides an average emission of the country selected, giving the students a way to situate their emission as higher or lower than their country's average. Moreover, when the students answer a question about their habits in the calculator, they immediately observe how this behaviour impacts their emission, making the link between behaviour and emission immediate. In the social learning network Einztein, their postings are gathered around specific discussion links in relation to the subject and their carbon footprint in general. They are also organised into sessions. Every second month a new session starts and all the students involved start posting at the same time in order to maximise the interaction.

There are two ways to participate in the discussions. Students can submit posts, which are direct replies to the main topic, or they can reply to another student by writing comments. This study focuses on a session from November 2012 with 28 posts from students in the six countries. The empirical material is analysed in relation to the integrated content and the students' language use.

## **3. Result and discussion**

In a comparison between the posts written by native English speakers and non-native English speakers, the result implies that the fact that most students are non-native speakers does not hinder the reflection or diminish the level of meaning making. In analysing the language use in relation to the content, the results imply common structures in students' discourse with six different phases or elements: (i) Expectation: students talk about their expectations for their own emission compared to the national average, (ii) Results: students communicate their own emission and compare it to the

national average after calculation, (iii) Reflection: students make sense of their own carbon footprint in the light of the knowledge acquired by the calculator, (iv) New resolution: students reflect upon the change they are willing/able (or not) to make to decrease their footprint, (v) Share knowledge: students share pieces of environmental information or give advice to the ISFCFC community, and finally (vi) Global dimension: students step back and see the issue globally, involving all of us rather than just their personal behaviours.

If we compare the number of words by posts, the average for US students is 182 while for the non-native English speaker it is 156. There is no significant difference between both groups,  $F(1, 26) = 46, p = .50$ . If we compare the number of phases present in each post, the average for US students is 4.28 while the average is 3.71 for non-native English speakers. There is no significant difference between both groups,  $F(1, 26) = 2.31, p < .14$ .

Our results indicate that the shared space in the social learning network in relation to motivating content implies that the students' language is productive and sufficient enough for communication and collaboration. This space could be described as an *affinity space* (Gee, 2004). Deriving from Lave & Wenger's (1991) concept of communities of practice, Gee's (2004) concept of *affinity space* is defined as a "place or set of places where people can affiliate with others based primarily on shared activities, interests, and goals, not shared race, class, culture, ethnicity, or gender" (p. 73). Affinity spaces are thus spaces where people meet for a certain purpose to pursue a common endeavour or goal, which does not necessarily mean that they share or belong to a community of practice. We would argue that the concept of affinity spaces explains how communication in social media opens up possibilities of considering affordances while discussing and learning about specific content and using language, which in this environment, do not separate language competences into discrete skills. Recognising the interaction as affinity spaces implies that the content of the discussion is in focus, i.e., the students' presumptions about their own impact is crucial and whether they are English natives or not is not as important when it comes to developing an understanding of their own responsibilities regarding carbon footprints.

#### 4. Conclusions

The basis of EE can be regarded as a challenge to the traditional schooling system based on the acquisition of factual knowledge brought to the classroom by the teacher in order to solve a problem with an already existing, single and correct solution. Accompanied by the CLIL approach, which "includes the learning of the target language as a subject in parallel to it being used as a vehicle for content learning" (Coyle, 2007, p. 552), the use of social media could be fruitful. The interlinked goals and the settings where language itself and the communication become meaningful for the students have, thus, in this study, shown to support both the content and the language learning.

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